MPS II: Plasma cell delivery of iduronate sulfatase

Grant Award Details

MPS II: Plasma cell delivery of iduronate sulfatase

Grant Type: Therapeutic Translational Research Projects

Grant Number: TRAN1-12911

Project Objective: The objective of this award is to conduct a well-prepared pre-IND meeting to discuss the development of ISP-002, which is autologous plasma cell blasts genetically engineered with a Sleeping Beauty transposon to express iduronate sulfatase (IDS), for treatment of mucopolysaccharidosis type II.
To achieve this final objective, the team proposes an in vivo dose-ranging study in mice, in vivo six-month pharmacology study in mice, manufacturing of the drug product with process development and engineering runs, manufacturing of critical GMP-grade reagents (such as transposon and transposase), and preparation of a pre-IND package.

Investigator:

Name:	Robert Hayes
Institution:	Immusoft Corporation
Type:	PI

Disease Focus: Genetic Disorder, Metabolic Disorders

Human Stem Cell Use: Somatic Cell

Award Value: $3,994,676

Status: Active

Grant Application Details

Application Title: MPS II: Plasma cell delivery of iduronate sulfatase

Public Abstract:

Translational Candidate

The patient's own B cells will be engineered to express the therapeutic enzyme needed for care in Mucopolysaccharidosis type II (MPS II) patients

Area of Impact

MPS II, a rare genetic disease causing multi-organ symptoms and death by age 15, if not treated. Current treatment does not address major symptoms.

Mechanism of Action

The proposed therapeutic is a unique combination of cell therapy and genetic engineering. The patient's own B cells are engineered to express the therapeutic enzyme iduronate 2-sulfatase (IDS) which prevents accumulation of glycosaminoglycans in various tissue. The cells are then placed back into the patient where they secrete the IDS at a therapeutic level. The treatment provides patients with sustained long-term (years) delivery of the therapeutic at levels not seen with other treatments.

Unmet Medical Need

Current treatment for MPS II does not provide the therapeutic at sufficient and stable levels, resulting in considerable residual burden of disease.
Our treatment will deliver the therapeutic at high, stable levels, addressing also those manifestations that are currently not met.

Project Objective

Pre-IND meeting, transfer to clinical trials.

Major Proposed Activities

- Dose-ranging rodent studies to determine minimal effective and maximal tolerated dose. Effectiveness will be evaluated using established biomarkers.
- Long-term efficacy rodent studies (6 months) to characterize treatment effects, including bone manifestations.
- Drug product manufacturing, process development and engineering runs to meet specifications. GMP manufacturing of critical reagents.

Statement of Benefit to California:

MPS II is a rare genetic disease, with no race or ethnic predilections. Current treatment is expensive ($250K-500K/year/patient) and does not affect key manifestations of the disease. Our approach promises an economic and effective therapy. Immusoft of California has a strong relationship with an MPS II key opinion leader at UCLA. We are strongly considering using clinical site(s) within the UC system, because they offer broad reach to diverse communities throughout California.
